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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
CORRIGAN, JAIME W	

ART UNIT	PAPER NUMBER
3748	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/067,050	LEMAN ET AL.	
	Examiner	Art Unit	
	Jaime W Corrigan	3748	

-- The MAILING DATE of this communication appears on the cov r sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *14 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

This Office Action is in response to the Amendment filed on 14 November 2003. Claims 1, 13, 17-18, 24 have been amended. Overall, claims 1-34 are pending in this application. The arguments with respect to the references applied in the first Office Action were deemed persuasive, however, a new non-final rejection is set forth below. The rejections of claims 1-34 in the first Office Action are being withdrawn based on arguments made at page 9, lines 15-23, Page 10 Lines 1-7; Page 10 Lines 14-22, Page 11 Lines 1-3; Page 11 Lines 10-24; Page 12 Lines 6-16.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-12 rejected under 35 U.S.C. 102(b) as being anticipated by Kanzaki (PN 6,006,706).

Regarding claim 1 Kanzaki discloses an engine cylinder (See Figure 1); an engine piston (See Figure 1, Abstract) reciprocatingly disposed in the engine cylinder; a valve (See Figure 1 (11)) operatively associated with the engine cylinder; a mechanically (See Figure (6), (6a), (7), (8), (9)) driven actuator adapted to open the valve; a fluidically driven actuator (See Column 4 Lines 29-42, Column 6 Lines 44-Column 7 Line 7) adapted to open the valve; at least one sensor (See Column 8 Lines

30-35) associated with the engine and adapted to generate an operation signal representative of an engine operation; and a controller (See Figure 1 (5)) adapted to receive the operation signal and transmit (See Column 8 Lines 30-35) a control signal to the fluidically driven actuator and opening the valve based on the operation signal.

Regarding claim 2 Kanzaki discloses the fluidically driven actuator is in constant communication with one of a source of high pressure fluid and a source of low pressure fluid (See Figure 1 (13), 17)).

Regarding claim 3 Kanzaki discloses the controller generates the control signal during a compression stroke (See Figure 4) of the engine.

Regarding claim 4 Kanzaki discloses the controller generates the control signal during an intake stroke (See Figures 1, 4) of the engine.

Regarding claim 5 Kanzaki discloses the valve is an intake valve (See Figure 1, Column 5 Lines 58-61).

Regarding claim 6 Kanzaki discloses the valve is an exhaust valve (See Figure 1).

Regarding claim 7 Kanzaki discloses the control signal actuates the fluidically driven actuator a predetermined length of time (See Column 4 Lines 29-42, Column 6 Lines 44-Column 7 Line 7).

Regarding claim 8 Kanzaki discloses the sensor monitors engine crank angle and wherein the control signal is generated in response to the engine crank angle being at a predetermined crank angle (See Figure 4).

Regarding claim 9 Kanzaki discloses the predetermined crank angle is approximately 528 degree of engine crank angle (See Figure 4).

Regarding claim 10 Kanzaki disclose the predetermined crank angle is approximately 498 degree to 558 degree of engine crank angle (See Figure 4).

Regarding claim 11 Kanzaki discloses the sensor monitors engine speed (See Figure 3).

Regarding claim 12 Kanzaki discloses the sensor monitors temperature (See Figure 3).

Claims 13-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Tamura et al. (PN 6,101,998).

Regarding claim 13 Tamura discloses an actuator cylinder (See Figure 3 (4)) having a fluid passage (See line between (57 and (4)); an actuator piston (See Column 9 Lines 16-19) reciprocatingly disposed in the actuator cylinder (See Figure 3 (4)); and a control valve (See Figure 3 (60)) operatively associated with the actuator cylinder, said control valve having a housing (See Figure 3 (60)), said housing having a low pressure (See Figure 3 (58)) fluid inlet, a high pressure fluid inlet (See Figure 3 (56)), (57)), and a fluid outlet (See Figure 3 line between (57 and (4)), a plunger (See Figure 3 (60)) having first and second ends reciprocatingly disposed in the housing, the plunger being movable between a first position at which the low pressure fluid (See Figure 3 (58) inlet is in communication with the fluid outlet, and a second position at which the high pressure fluid inlet (See Figure 3 (56)) is in communication with the fluid outlet, the fluid outlet (See Figure 3 line between (57 and (4)) being in fluid communication with the actuator cylinder fluid passage (See Figure 3 (4)).

Regarding claim 14 Tamura discloses an electromagnetic device (See Column 9 Lines 16-19) proximate the plunger first end, and a spring (See Figure 3 (59)) proximate the plunger second end, said plunger being movable to the first position upon deactuation of the electromagnet device (See Figure 3 (59)), said plunger being movable to the second position upon actuation of the electromagnetic device (See Figure 3 (59)).

Regarding claim 15 Tamura discloses an actuator plunger operatively associated with the actuator piston and adapted to extend through an aperture disposed in the actuator cylinder when the control valve plunger is in the second position (See Column 9 Lines 16-19).

Regarding claim 16 Tamura discloses the actuator plunger is unitary with the actuator piston (See Column 9 Lines 16-19).

Claims 17-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakamura et al. (PN 6,020,651).

Regarding claim 17 Nakamura discloses an engine piston (See Abstract) reciprocatingly disposed in the engine cylinder; a valve (See Figure 3 (57)) reciprocatingly disposed in a port extending from the engine cylinder; a first source of pressurized fluid (See Figure 1 (1)); a second source of pressurized fluid (See Figure 1 (2)), the second source being pressurized to a higher level (See Column 6 Lines 42-50) than the first source; and a valve actuator (See Figure 1 (5)) adapted to be in fluid communication with the first and second source of pressurized fluid, the first source (See Figure 1 (1)) taking up any lash associated with the engine, the second source (See Figure 1 (2)) causing the valve actuator to open the valve.

Regarding claim 18 Nakamura discloses the valve actuator includes an actuator

cylinder (See Figure 3 (62)) having an actuator piston (See Figure 3 (61)) reciprocatingly disposed in the actuator cylinder, and a control valve (See Figure 1 (3)) adapted to direct pressurized fluid from one of the first and second sources of pressurized fluid to the actuator cylinder.

Regarding claim 19 Nakamura discloses a housing (See Figure 1 (3)) having a low pressure fluid inlet (See Figure 1 (1)), a high pressure fluid inlet (See Figure 1 (2)), and a fluid outlet (See Figure 1 (5)); a spool (See Figure 1 (3)) reciprocatingly disposed in the housing, the spool having first and second ends, the spool adapted to move from a first position connecting the low pressure fluid inlet to the fluid outlet to a second position connecting the high pressure fluid outlet to the fluid outlet (See Column 5 Lines 16-30); an electromagnetic device (See Figure 1 (3)) operatively associated with the spool first end, the spool being movable to the second position upon actuation of the electromagnetic device; and a spring (See Figure 1 (3)) operatively associated with the spool second end, the spool being movable to the first position by the spring upon deactuation of the electromagnetic device (See Figure 1 (3)).

Regarding claim 20 Nakamura discloses the first source of pressurized fluid is a lubrication oil system of the engine (See Column 5 Lines 16-30).

Regarding claim 21 Nakamura discloses the second source of pressurized fluid is a high pressure rail of the engine (See Figure 1 (2)).

Regarding claim 22 Nakamura discloses the valve is an exhaust valve (See Figure 3 (57)).

Regarding claim 23 Nakamura discloses the valve is an intake valve (See Figure 3 (57)).

Regarding claim 24 Nakamura discloses the valve actuator is fluidically (See Figure 3 (56)) driven, and wherein the engine further includes a mechanically driven actuator (See Figure 3 (55), (60)).

Claims 25-34 are rejected under 35 U.S.C. 102(b) as being anticipated by Hu (PN 5,839,453).

Regarding claim 25 Hu discloses an engine having an engine cylinder (See Figure 9, Abstract), an engine piston (See Abstract) reciprocatingly disposed in the engine cylinder, a valve port (See Figure 9) in fluid communication with the engine cylinder, a valve (See Figure 9 (30b)) reciprocatingly disposed in the valve port, a fluidically driven valve actuator (See Figure 9 (70b)) operatively associated with the valve, a mechanically (See Figure 9 (130b), 40b)) driven valve actuator operatively associated with the valve, a source of low pressure fluid (See Figure 1 (90)), and a

source of high pressure fluid (See Figure 1 (80)), the engine having intake, compression, power and exhaust strokes (See Abstract); supplying one of the low and high pressure (See Column 4 Lines 1-37) fluid sources to the fluidically driven actuator; opening the valve during one of the intake and exhaust strokes using the mechanically driven actuator (See Abstract, Column 7 Lines 20-34); and opening the valve during the compression stroke using the fluidically driven actuator (See Abstract, Column 7 Lines 35-57).

Regarding claim 26 Hu discloses the opening steps are performed using an intake valve (See Figure 9 (30b)).

Regarding claim 27 Hu discloses the opening steps are performed using an exhaust valve (See Figure 9 (30b)).

Regarding claim 28 Hu discloses the opening step using the fluidically driven actuator is performed by connecting the source of high pressure fluid (See Figure 1 (80)) to the fluidically driven actuator (See Abstract, Column 7 Lines 35-57).

Regarding claim 29 Hu discloses the source of low pressure fluid is a lubrication oil system of the engine (See Column 4 Lines 12-13).

Regarding claim 30 Hu discloses the source of high pressure fluid is a

high pressure rail of the engine (See Column 4 Lines 1-13).

Regarding claim 31 Hu discloses the source of low pressure fluid is used to take up any lash in the system (See Column 4 Lines 14-37).

Regarding claim 32 Hu discloses the engine further includes a control valve (See Figure 1 (60), (40)) adapted to connect one of the low pressure source (See Figure 1 (90)) and high pressure (See Figure 1 (80)) source to the fluidically driven actuator.

Regarding claim 33 Hu discloses the engine further includes a processor (See Figure 1 (110)) and a sensor (See Figure 1 (114), Column 4 Lines 52-54), the sensor being adapted to transmit a signal representative of engine operation to the processor, the processor adapted to transmit a signal to the control valve based on the signal from the sensor (See Figure 1 (114), Column 4 Lines 52-54).

Regarding claim 34 Hu discloses the sensor is adapted to monitor one of the group of parameters consisting of engine speed, engine crank angle, temperature, engine load, and fuel delivery (See Column 4 Lines 52-54).

Response to Arguments

Applicant's arguments with respect to claims 1-34 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Nishikawa et al. (PN 4,643,049), Feucht (PN 5,615,646), Vattaneo et al. (PN 5,839,400) disclose similar valve actuators.

Any inquiry concerning this communication from the examiner should be directed to Examiner Jaime Corrigan whose telephone number is (703) 308-2639. The examiner can normally be reached on Monday - Friday from 8:30 a.m. – 6:00 p.m. 2nd Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion, can be reached on (703) 308-2623. The fax number for this group is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0861.

JC

Jaime Corrigan
Patent Examiner

January 26, 2004

Art Unit 3748